



Jongsomjit–Understanding Adélie Penguin Winter Ecology

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1. Adelie penguins are key indicators of ecosystem function in the Ross Sea but relatively little is known about their wintering ecology.
2. We combined penguin location and foraging data with AMSR-2 sea ice data to examine yearly changes in relation to the boundaries of the Ross Sea Region MPA (RSRMPA).
3. We identified winter foraging hot spots for the first time, showing partial overlap with the RSRMPA.
4. We identified molting areas and associated ice conditions for the first time - largely (but not entirely) within the boundaries of the RSRMPA and varying by colony.
5. We found that sea ice movement facilitates penguin travel with ice assistance accounting for up to 30 additional km travelled per day.
6. Our findings emphasize the importance of the RSRMPA, and raise concerns about the future ecosystem function of the Ross Sea, particularly as sea ice concentration, wind, and ocean currents are all projected to change in the coming decades due to climate change.